



Multiform Korean handwriting authentication by forensic document examiners



Tae-Yi Kang, Joong Lee *

Digital Technology & Biometry Division, National Forensic Service, 10, Ipchun-ro, Wonju-si, Gangwon-do, South Korea

ARTICLE INFO

Article history:

Available online 10 July 2015

Keywords:

Forensic science
Handwriting identification
Validation
Peer review

ABSTRACT

Forensic document examiners of Multiform Korean handwriting were tested using blind trials. A small number of experts (4) were tested for their performance and the test involved three steps. The participants each conducted a one-person examination first, then paired up with another person to perform the two-person examination and then finally the four people came together to conduct a group examination. When the experts actively exchanged opinions, the percentage of misleading decisions decreased while the percentage of inconclusive opinions increased. The deviations in the percentages of misleading results for different handwriting samples (long, short, signature) were not significant, while the disguised handwriting results showed the highest percentage of misleading conclusions. A special attention to artificially modified handwriting is therefore warranted rather than focusing on the number of letters.

© 2015 Elsevier Ireland Ltd. All rights reserved.

1. Introduction

A person's handwriting does not have a fixed form unlike printed letters. Furthermore, it varies significantly, thereby making scientific handwriting analysis difficult.

This is why handwriting examination is mostly dependent on the accumulated knowledge and experience of the examiners. Therefore, a handwriting examiner must undergo substantial training. However, despite the training the examiners go through and their accumulated experience, there is still room for errors.

Found's group used a medium of blind validation to measure the percentage of misleading and evaluate the examination accuracy of the examiners for English signatures [1], while Moshe Kam's group performed a study on the signature examination accuracies of forensic document examiners (FDEs) and laypeople [2].

Studies on the effect of monetary rewards regarding the handwriting examination of laypersons have been conducted [3], however there has not been any study on Korean handwriting.

Furthermore, studies on disguised handwriting and simulated handwriting of signatures have been conducted [4–6], but there still is not any study on the number of letters and the accuracy of examination.

In this study on Korean handwriting, (1) the handwriting examination accuracy of experts were analyzed and (2) the relationship between the peer-review of experts and the examination result was examined. In addition, (3) the examination results of natural, disguised and simulated handwritings were analyzed, as well as (4) the relationship between the number of letters and the accuracy of the examination result.

2. Test method

2.1. Sample preparation

2.1.1. Handwriting collection

Different handwriting samples of 500 people, who are over 20 years old and residing in Korea were collected (the ratio of men to women was 1:1).

Each writer submitted his own handwriting sample (natural handwriting), an altered version of their own handwriting (disguised handwriting), and an imitation of another person's handwriting (simulated handwriting). In the test, three kinds of handwriting samples were collected—long handwriting (three sentences), short handwriting (more than five words), and handwritten name and signature. A sufficient amount of time was given rather than a fixed amount of time.

The pen and the paper used in the handwriting examination was an ordinary black ballpoint pen and A4 paper, which were both easily available in the market.

* Corresponding author. Tel.: +82 33 902 5310; fax: +82 33 902 5922.
E-mail addresses: ljfirst@korea.kr, candy404@hanmail.net (J. Lee).

2.1.2. Handwritings used for the test

From all the collected handwritings, 180 handwritings (60 long handwritings, 60 short handwritings, and 60 signatures) were randomly selected for the test. To ensure the fairness of the test, people who did not participate in the test selected the handwriting samples which were going to be the used as the test question's handwriting samples. After a random selection, the final question handwritings consisted of 49 handwritings that simulated the comparison handwriting, 54 handwritings that disguised the comparison handwriting, 62 natural-genuine handwritings, and 15 natural-non genuine (other person's) handwritings. Three handwritings which included the same words as the questioned handwriting were provided for comparison.

The signature and short handwriting questions consisted of natural-genuine, simulated, and disguised handwriting. Meanwhile, long handwriting questions consisted of natural-genuine, simulated, disguised, and natural-non genuine (other person's) handwriting (Figs. 1–6).

2.2. Test method

The participants of this test were four experts and the test involved three steps. The participants each conducted a one-person examination first, then paired up with another person to perform the two-person examination and then finally the four people came together to conduct a group examination.

The participants were not given any specific information prior to the test and were not allowed to consult with other experts during the test for the accuracy of the test. Before participating in the test, all experts wrote a pledge that they would do their best.

They would not discuss with anyone during the one-person examination session but, they were allowed to discuss freely within the corresponding groups and the test time was not limited for all experts.

2.3. Participants

The participants in this test were experts who have been involved in the document examination field for more than three

살인사
이름: 이호진
주거: 부산광역시 서구서 행영동-25번지 82 (생략) : 015-2379-0258)
생기른 2009년 6월 하소정 재판문재인 이인적으로부터 임근 이집안역사 연구백독점
오만산판판백림입업원 (사자 349, 653, 871년)에 대한 거래 내역서를 구해달라는
부탁을 받고 평소 알고 있는 김태환과 권행중, 나완용등서가 갑자기 연락이 되지
않았습니사.
고해서 광복기원과 계약하는 조건으로 사무실에 가서 서류제출을 하였습니사.
아무리 내방하는 기분이 없습니사

Fig. 1. Example of long handwriting.

사살입니다 본인은 병적전하를 입습하얏습 선습으로
취업발가는 비안하사 800227-2714319 권습습습나 010-281-1397

Fig. 2. Example of short handwriting.

국과수

Fig. 3. Example of signature.

사살입니다 본인은 병적전하를 입습하얏습 선습으로
취업발가는 비안하사 800227-2714319 권습습습나 010-281-1397

Fig. 4. Example of natural handwriting.

years in national institutions. Three different methods – one-person examination, two-person examination, and four-person examination methods – were used in this test to study the effect of the one-person examination and peer review on the handwriting examination result.

In the one-person examination, a single person performed the examination of 180 handwriting samples. Afterwards, two persons paired up as a team and two teams performed the re-examination. Then, those four people came together and performed the handwriting examination again.

2.4. Selection of answers

During the test, all the participants had to select one of the following four answers. Answer choices 2 and 3 did not require a participant to make a definite decision, but there was no answer choice that completely excluded a decision. Answer choice 2 and 3 were provided to participants to see the changes in the percentage of correct answers and incorrect answers when “No opinion” was accepted as an answer choice and when it was not.

1. “Genuine”: The questioned handwriting was written by the writer of the handwriting specimens’.
2. “No opinion (inconclusive opinion)-Genuine”: “No opinion” can be expressed as to whether or not the questioned handwriting was written by the writer of the handwriting specimens’. But the questioned handwriting seems to be written by the writer of the handwriting specimens’.
3. “No opinion (inconclusive opinion)-Non genuine”: “No opinion” can be expressed as to whether or not the questioned handwriting was written by the writer of the handwriting specimens’. But the questioned handwriting does not seem to be written by the writer of the handwriting specimens’.
4. “Non genuine”: The questioned handwriting was not written by the writer of the handwriting specimens’.

3. Results

Result analysis was performed in two different ways, as stated below in 1–2, to analyze the change in the percentage of incorrect answers when “No opinion” was accepted and when it was not. Thus, when “No opinion” was accepted as a valid answer choice,

사살입니다 본인은 병적전하를 입습하얏습 선습으로
취업발가는 비안하사 800227-2714319 권습습습나 010-281-1397

Fig. 5. Example of disguised handwriting.

Download English Version:

<https://daneshyari.com/en/article/95321>

Download Persian Version:

<https://daneshyari.com/article/95321>

[Daneshyari.com](https://daneshyari.com)